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# RECENT CONDITIONS OF THE RAILWAY OF CHINA

## Railway Construction and the Installation of Long Rails

Until about 1957 China made considerably detailed reports on her railway, construction including the publication of the serviceable mileage. However, during the past several years no announcement has been made and the extent of China's railway construction is unknown. But a China News Agency dispatch originating in Peking on 5 October 1965 reported:

"The railway construction of the new China has made rapid progress. Railway lines reach every province and autonomous region of the mainland with the exception of Tibet. The railway mileage of the entire nation has reached over 36,000 kilometers, or three times that of the early post-liberation period. In addition to this, many sidings for factories, mines and forest railways have been constructed."

The following table shows the serviceable railway mileage year after year (unit: kilometer).

| Year | Serviceable Mileage | Year | Serviceable Mileage |
|---|---|---|---|
| 1948 | 12,768 | 1954 | 25,873 |
| 1949 | 21,989 | 1955 | 27,171 |
| 1950 | 22,512 | 1956 | 29,237 |
| 1951 | 23,325 | 1957 | 29,862 |
| 1952 | 24,518 | 1962 | 35,000 |
| 1953 | 25,072 | 1965 | 36,000 |

(1962 figures are based on an article by Hai Feng in Jenmin Jih-pao (People's Daily), 12 May 1964, and 1965 figures are based on the China News Agency dispatch of 5 October 1965.)

According to this table, even after 1957, the last year of the first Five-Year Plan, more than 7,000 kilometers of railway were constructed. It is clear that about 1,000 kilometers of railway were constructed in the stage of economic adjustment in comparison with 1962, when China had experienced three consecutive years of natural disasters and was barely able to overcome the economic difficulties confronting her.

It is not known how and where such railway construction progressed. However, a NCNA dispatch from Wuhan on 8 January 1966 stated that a rail line with a total length of 420 km from Wuhan to Tan-chiang-k'ou via the six hsien of Yun-meng, An-lu, Sui Hsien, Tsao-yang, Hsiang-yang, and Kuang-hua in the northwestern hilly area of Hupei Province was entirely completed on 1 January. Construction of this Han-tan rail line was begun in 1958. The project proceeded on the method of opening each section to traffic upon completion within the set time. With the completion of this line, it is estimated that industrial and agricultural production in these areas will be further accelerated.

Although it is not directly related to railway construction, it is noteworthy that the installation of long rails for China's recent railways has been promoted. Each long rail is 100 meters in length, and it is welded together by various welding methods in order to reduce the friction between vehicle and rail. Long rails are to replace the previously used rails 12.5 meters long. The installation of long rails in the Peking-Tientsin Line was completed on 31 May 1965, and following this replacement work is in process in Kwangtung Province on the Peking-Kwangchow Line. The replacement of short rails with long rails is to be one of the most important steps in the technological renovation of China's railways. When short rails are used, train cars jolt because of many joints and their roaring sound does not cease. When long rails are used, the number of joints is reduced, and trains run more quietly at higher speeds. Long rails have longer life, thus allowing for economization of steel materials and reduction of railway maintenance costs.

For installing long rails, a special mechanized long rail-carrying train has been manufactured and is in use. It was the Peking rail welding team of the Peking Railway Bureau that first succeeded in the trial manufacturing of this rail-carrying train. It has a device for quietly placing long rails on both sides of the tracks by the use of the motive power of the locomotive. It requires only 24 minutes to unload 1 kilometers of long rails. Also, with the exchange of various equipment, 1 kilometer of old rails can be directly retrieved in 40 minutes. The Mukden Locomotive Plant has also manufactured a mechanized rail-carrying and unloading train, different from the one made in

Peking. The entire length of this train is 271 meters, longer than the Peking-made one, and it is capable of loading two layers of long rails. Thus its mechanization is more advanced than the Peking train, and it has better equipment. Furthermore, the Kwangchow Railway Bureau, in view of the characteristic, that rails in its jurisdiction have large bends, has manufactured for trial a special long rail-carrying train and a pair of special devices for loading and unloading long rails, in order to make the long rail curves smooth.

## Speeding Up and The Increase of Transportation Capability

In the railway sector of China, in addition to the afore-mentioned constructions and technical renovations, much effort has been exerted for the strengthening of transportation capability and speeding up.

Beginning on 21 April 1965, the Ministry of Railways switched the nation's passenger train schedule into a summer time schedule for the speeding up of passenger trains. With this schedule, the running time of express trains 11 and 12, leaving simultaneously from Peking and Mukden respectively, was cut by 56 minutes; express trains 91 and 92 leaving simultaneously from Peking and Tientsin, by 30 minutes; express train No 13 leaving Peking for Shanghai, by 2 hours and 15 minutes; express train No 15 leaving Peking for Kwangchow, by 3 hours and 11 minutes; and express train No 19 leaving Peking for Chungking by 6 hours and 51 minutes, respectively.

Also, according to the record of May 1965, the China's freight trains increased their hourly speed by 2 km per hour over that in May 1964. The speeding up of freight trains is reported to be equivalent to an increase of 200 locomotives and 2,000 freight cars. This speeding up is due to improved inspection and maintenance, improved of roadbeds, curtailment of stopping time, and improved tractive capacity of locomotives. As of May 1965, the speed of freight trains was speeded up by 8 kilometers per hour compared with that during the early post-liberation period.

Beginning on 21 November 1965, a new train schedule was put into effect throughout the entire nation. Subsequently, the running time of passenger trains was cut on the average by 10%. In this new schedule, the Peking-Shanghai express train shortened its running time by 2 hours and 21 minutes, requiring 23 hours and 19 minutes for the trip. The Peking-Kwangchow train shortened its running time by 2 hours and 39 minutes over the previous schedule.

The reduction in the running times of these trains are reported to be due to the improvement of the efficiency of locomotives and railway facilities, and to the improvement of roadbed maintenance.

In freight transportation, the Ministry of Railways has increased the running of small freight trains for small sundry freight from rural areas since 1964. These trains can reach almost anywhere and are capable of transporting as much freight as necessary. Therefore, they are termed by the peasants along the lines as the "peasant trains," and are welcomed by peasants. With the large increase in the running of domestic animal and poultry trains, the transportation volume of fresh and perishable commodities has been greatly increased. Therefore, in the railway sector, six round-trip expresses have been put into operation since 1964 on the three trunk lines of the Peking-Kwangchow line, the Tientsin-Pukow line, and Peking-Tientsin-Mukden line for the special transportation of fresh and perishable commodities. The express train can cut transportation time by one third compared with the ordinary train. Thus with the opening of this express train service, the volume of agricultural by-products, farm chemicals, chemical fertilizers, and farming machines transported by the railway sector up to the third quarter of 1964 was increased by 25% compared with the corresponding period of the previous year.

In the railway system, the handling of passengers and freight at small stations in between has recently been opened up, items of business have been expanded, passenger stops between far apart stations have been established, and the number of shuttle trains for passengers and small freight trains has been increased. Passenger stops for ordinary passenger trains have been increased, and large freight loading zones have been built for trunk lines, branch lines, and sidings. Thus the transportation network composed of fast trains running through China from north to south, fast small freight trains of various railway bureaus, and small freight trains for short sections has already been rudimentarily organized.

Moreover, the railway workers have formulated and are practicing the revolutionary "transportation formula." This is to maintain a balance for every month, for every ten days in the plans for transportation operation in each sector of railway, and the plans in the sector of consignment transportation, to generally take into consideration demands from various areas, and thus to make general and rational allocation. In formulating their transportation formula, they must penetrate into the production, sales, and distribution sectors, have a detailed grasp of the conditions of materials for each period, and on this basis,

coordinate the work of the railway sector and the units of the consignment transportation sector, thus properly aiming at joint transportation. Such an organizational method in railway transportation creates a new relationship of mutual cooperation among socialist enterprises and among various sectors of railway.

Until recently, in the sector of railway transportation, after the completion of the plans for monthly freight transportation, they generally waited for "the freight to knock at the door," and formulated transportation operation for the following day on the basis of the preceeding day's consignment plan required, by units of transportation consignment. Consequently, cars were available while freight was lacking, and freight loads existed when cars were not available. This resulted not only in the waste of transportation capability but also in delay in the transportation of freight, and in poor organization of through transportation which delayed the rotation time of locomotives and cars and increased the volume of work at freight stations.

However, since the execution of the "transportation formula," these conditions have been greatly modified. In the case of the Tsinan Railway Bureau, 43% of the currently operating freight cars are through freight cars, and a very great transportation potential has been mobilized. The rotation time of the rolling stock of this bureau during the first half of 1965 was on the average 1.17 days. Thus compared with the corresponding period of 1964, on the average 400 freight cars per day were saved. Earlier, the two freight stations at Tsinan and Hsu-chou could not meet the daily intensifying transportation demand, but since the increased dispatch of through trains, this difficulty has been aleviated along with a reduction of marshalling operations.

## Manufacturing of Locomotives and Rolling Stock

What is noteworthy of late in China's railway sector in addition to the foregoing constructions and the measures for strengthening transportation capability is the establishment of the mass production system for diesel engines, replacing the previously widely used steam engines, and the fact that diesels are already being used in long distance runs such as on the Peking-Paotow and Peking-Chengteh Lines. A detailed introduction of the production of China's diesel engines was made in No 46 of this publication (dated 15 April 1965). Now there are three types of diesel engines that China has succeeded in trial manufacturing. They are

the 2,000 horsepower, 1,200 horsepower, and 600 horsepower engines. These three types are used for passenger and freight transportation engines on the trunk lines, short distance transportation engines, and marshalling and tractive engines for factories and mines respectively.

Because China's railway factories were previously capable of producing only steam engines, many technological difficulties had to be solved before they could manufacture the more complicated diesel engines. However, a grand cooperation was materialized with the various rolling stock factories in the railway sector, and with the participation of other factories under the Ministry of Railways, nine other sectors including machines, metallurgy, and chemical industry, more than 100 factories, and more than ten scientific research units and universities in the successful trial manufacturing of large horsepower diesel engines in a short period of time.

Among these, the Dairen Engine and Rolling Stock Factory has established a diesel engine workshop and has succeeded in manufacturing large horsepower diesel engines. During the Japanese occupation, the Dairen Engine and Rolling Stock Factory was capable only of inspecting and assembling steam engines. But only four years after the establishment of the new China it began on a full scale the production of steam engines; then in a short period of only three years thereafter, without interrupting or reducing the production of steam engines, it remodeled the old-type factory for the production of steam engines to a new factory capable of mass producing diesel engines. Thus since 4 June 1965, it has been changed to a new enterprise to mass produce diesel engines. In the process from the trial manufacturing of the diesel engine to its mass production, the greatest difficulties were that the old-type platforms for the production of steam engines were not suitable for the production of diesel engines, that factory buildings, special equipment and special materials for the production of diesel engines were lacking, that expert engineers or skilled laborers were not available, and that many of the workers had never seen a diesel engine. However, in less than two years the workers created or improved more than 100 pieces of special equipment and more than 1,600 sets of technical provisions such as the "medium frequency oil hardening machine," the "cam shaft lathe," the "profiling machine," and succeeded in the trial manufacturing of more than 10 new materials. The workers also made major repairs or remodeled 13 factory buildings amounting to almost 20,000 square meters. They totally remodeled dirty and dilapidated factory buildings in the general assembly workshop in only two months and changed them into new factories for modern diesel engine assembling.

In respect to the manufacturing of engines, it is noteworthy that the Ta-t'ung Engine and Rolling Stock Factory improved the new Chinese-designed large type engine for freight -- the "Ho-p'ing" type steam engine -- and began its mass production. The tractive power of this engine is more than 3,000 horsepower, and it is the most powerful of the engines produced presently in China. Its quality and technical indices surpass those of other known engines both at home and abroad. Its boiler has a sufficient steam supply, and the engine can run at a high speed with a full load of freight despite cold or storm, through curves and up grades.

In the aspect of rolling stock manufacturing it should be particularly noted that China's steel industry has recently begun production of low alloy steel, open wagons and light oil tankers.

The low alloy steel open wagon was designed jointly by the workers of the Tsitsihar Rolling Stock Factory and of the Boxcar Institute. It was successfully manufactured this year. Its carrying capacity is 65 tons, and it presently has the largest carrying capacity among Chinese-made cars; it is a large four-axle open wagon. This was manufactured with ordinary low alloy steel produced in China, and since it is all electrically welded, a 10-20% saving in steel materials is possible. The previous type of open wagon had no side gate at either ends, which made the loading of coal and sand very inconvenient. But the structure of this type of open wagon has been remodeled; now there are side gates at both ends for convenience in both mechanized and manual loading. This improves loading efficiency. And for the running structure of the rolling stock, a new type of car has been adopted to suit high speed running.

The low alloy steel light oil tanker was manufactured by the Dairen Engine and Rolling Stock Factory in cooperation with the Peking Designing Institute of the Ministry of Petroleum Industry and the Boxcar Institute of the Ministry of Railways. It now has the largest capacity of all Chinese cars. In the aspect of design, this tanker adopted a structure without center frame. Its load was increased by 20% and its dead load coefficient was reduced by 12%. The previous Chinese-made light oil tankers had pipes to suck up petroleum from the upper part, and their discharging efficiency was not good. But the new-type light oil tank adopted a design sloping to the center from both ends and a discharging device for the lower part. Thus petroleum can be discharged directly and rapidly from the lower part of the tank. The surface of the inside of the tank is sprayed with a chemical anti-corrosive agent. Thus oil corrosion of the metal inside surface of the tank can be prevented, and at the same time the heavy labor required to wash the tank is eliminated.